Dr. Hugh E. Montgomery
Associate Director for Research
Fermi National Accelerator Laboratory
P.O. Box 500
Batavia, IL 60510-0500

June 24, 2004

Dear Dr. Montgomery:

Attached please find our proposal to test a heavy liquid bubble chamber intended for WIMP searches in the MINOS near detector hall. While the technique is still in its early stages, previous experience acquired within the SIMPLE and PICASSO experiments and recent developments at the University of Chicago have shown that this approach might be a relatively simple route to building ton or even multi-ton WIMP detectors, with a large chance of discovery stemming from an optimal target composition and intrinsic background rejection. Detectors this massive will be required to probe supersymmetric WIMP models in their entirety, the ultimate goal in this field of Dark Matter searches.

This possibility has been discussed with several interested FNAL Scientists (Mike Crisler, Dan Bauer, Don Holmgren, Erik Ramberg, Rob Plunkett) and there appears to be the grounds for a very fruitful collaboration. Mike Crisler outlines in an accompanying letter the role FNAL might play in this collaboration. As Mike points out, the scientific returns from even a modest initial FNAL investment can be very sizeable.

I am personally extremely excited about the possibility of solidifying this common UoC-FNAL interest into a full-fledged scientific collaboration: if the proposed tests in the MINOS near detector gallery and Soudan underground laboratory yield the desired results, the existing vast FNAL experience in large bubble chamber design and construction would afford an incomparable opportunity to make the full promise of this approach to Dark Matter detection a reality.

Thanking you in advance for your attention to this proposal,
Sincerely,

J.I. Collar
Assistant Professor of Physics
Enrico Fermi Institute
University of Chicago